

# Hyperloop full-size, full-speed rolling road

This rolling road test rig is an important stage in the validation of Hyperloop. It can run at the full 1,200 km/h with the design vacuum. It is a large vacuum chamber, with a motor-driven drum.

## Flexibility

Hyperloop research needs to be very flexible, there will be many surprises, twists and turns in the development. So this rig can be used to test a variety of air cushion suspension styles, wheels, and possibly maglev.

## Size

The drum size is 2.5 m (8 ft) diameter, 2.5 m long. This large size is necessary to withstand the rotational forces (2,500 rpm) with welded steel or aluminium. Also to give a realistic contact area for the wheel.

## Air bearing skis

The ski shown is the full Alpha size of 1.5 m x 0.9 m. Also inside the vacuum chamber is the motor, compressor, and heat exchanger.

## Wheel

The wheel is mounted on a track, so that it can use the whole surface of the drum. If a metal wheel is used, the tube may need to be lined with a material like polyurethane, which would only be contacted every 30 seconds and will not heat up. With the test rig, the wheel can be moved along the drum to reduce overheating.

## Cooling

Cooling is an important issue for Hyperloop, due to the low conductance of the near-vacuum. The compressor, motors, and the turbulent air need to be cooled, this test rig can be used to find the best method. Alpha described the use of a heat exchanger, but there are other methods. The temperature from the compressor is 580 deg C.

## Cost

The cost would be about \$500,000 for the test rig and vacuum pump. The air ski or wheel equipment would be extra.

